

IN THE CLAIMS

1-7 Cancelled.

8. (New) A control apparatus for a variable-cylinder engine of a vehicle having an electric generator operatively connected to said variable-cylinder engine, said variable-cylinder engine having a plurality of cylinders, said control apparatus comprising:

an electricity-generating-mode determining device-operable to determine whether it is required to establish an electricity generating mode in which said electric generator is operated to generate an electric energy; and

a cylinder-number switching device, operable when said electricity-generating-mode determining device determines that it is required to establish said electricity generating mode, for placing said variable-cylinder engine in a partial-cylinder operating state in which selected ones of said plurality of cylinders are operated.

9. (New) A control apparatus according to claim 8, wherein said variable-cylinder engine has a pair of banks each of which has a plurality of cylinders and which are operable independently of each other, and said cylinder-number switching device is operable to place one of said pair of banks of said variable-cylinder engine in an operating state and place the other bank in a decompression state, when said electricity-generation-mode determining device determines that said electric generator is required to be operated to generate an electric energy.

10. (New) A control apparatus according to claim 8, wherein the vehicle has a shift lever having a plurality of operating positions including at least one drive positions for driving the vehicle, and at least one non-drive position in which the vehicle is not driven, said cylinder-number switching device being operable to change the number of operating cylinders of said variable-cylinder engine which are used to operate said electric generator, depending upon a presently selected one of said operating positions of said shift lever, such that all of said plurality of cylinders are placed in an operating state when said shift lever is placed in any one of said at least one drive position, and selected ones of said plurality of cylinders are placed in an operating state when said shift lever is placed in any one of said at least one non-drive position.

11. (New) A control apparatus for a vehicle to be driven by at one of an engine and an electric generator, as a drive power source, comprising:

a vehicle-deceleration detecting device operable to determine whether the vehicle is in a decelerating state; and

a drive-power-source braking control means device, operable when said vehicle-deceleration detecting device determines that the vehicle is in a deceleration state, for controlling a braking torque produced by said drive power source, on the basis of a regenerative braking torque produced by said electric generator, and an amount of decompression of non-operating cylinders of said engine.

12. (New) A control apparatus according to claim 11, further comprising:

a desired-deceleration calculating device operable when said vehicle-deceleration detecting device determines that the vehicle is in the decelerating state, to calculate a desired deceleration value of the vehicle under deceleration, on the basis of an actual running speed of the vehicle and a reset deceleration value preset by the operator of the vehicle, and according to a stored predetermined relationship among said desired deceleration value, said actual running speed and said preset deceleration value,

and wherein said drive-power-source braking control device is operable to control said drive-power source braking torque, on the basis of the regenerative braking torque produced by said electric generator and the decompression state of said non-operating cylinders of said engine such that said actual deceleration value of the vehicle coincides with the desired deceleration value calculated by said desired-deceleration calculating device.

13. (New) A control apparatus according to claim 11, wherein said drive-power-source braking control means includes:

a regenerative-braking-torque control device operable to control an amount of regenerative braking torque produced by said motor/generator;

a decompression-state setting device operable to place selected ones of the cylinders of said engine in a decompression state; and

a decompression-amount control device operable to control a resistance of those selected cylinders to an rotary motion of said engine.

14. (New) A control apparatus according to claim 11, wherein the vehicle includes a fluid-coupling device disposed between said engine and a transmission, said control apparatus further comprising:

a regenerative-braking-adjustment detecting device operable to determine whether it is necessary to adjust a regenerative braking operation of said electric generator; and

a lock-up clutch releasing device operable to place said fluid-coupling device in a released or partially slipping state, when said regenerative-operation-adjustment detecting device determines that it is necessary to adjust said regenerative braking operation.

15. (New) A control apparatus for a variable-cylinder engine of a vehicle having a transmission connected to said variable-cylinder engine, said variable-cylinder engine having a plurality of cylinders, said control apparatus comprising:

an engine-idling vehicle-stop detecting device operable to determine whether the vehicle is held stationary with said variable-cylinder engine being held in an idling state; and

a partial-cylinder/neutral-transmission control device, operable when said engine-idling vehicle-stop detecting device determines that the vehicle is held stationary with said variable-cylinder engine being in the idling state, operable to place said variable-cylinder engine in a partial-cylinder operating state and at the same time placing said transmission in a neutral state,

and wherein selected ones of said plurality of cylinders of said variable-cylinder engine are operated in said partial-cylinder operating state.

16. (New) A control apparatus according to claim 15, wherein the vehicle has a braking device, said control apparatus further comprising:

an engine-stop detecting device operable to determine whether the vehicle is held stationary; and

hill-holding means operable when said engine-stop detecting device does not determine that the vehicle is held stationary, for activating said braking device to hold the vehicle stationary.

17. (New) A control apparatus according to claim 16, further comprising:  
a partial-cylinder/neutral-transmission condition determining device operable to determine whether it is concurrently possible to place said variable-cylinder engine in said partial-cylinder operating state, place said transmission in a neutral state and operate said hill-holding device to hold the vehicle stationary; and

a full-cylinder operation commanding device operable when said partial-cylinder/neutral-transmission condition determining device determines that it is not concurrently possible to place said variable-cylinder engine in said partial-cylinder operating state, place said transmission in the neutral state and operate said hill-holding device to hold the vehicle stationary, said full-cylinder operation commanding device placing said variable-cylinder engine in a full-cylinder operating state in which all of said plurality of cylinders are operated.

18. (New) A control apparatus for a vehicle including a variable-cylinder engine and an electric motor as a drive power source, said variable-cylinder engine having a plurality of cylinders, comprising:

a motor-drive-mode detecting device operable to determine whether the vehicle is running in a motor-drive mode with an operation of said electric motor; and

a partial-cylinder operation commanding device, operable when said motor-drive-mode detecting device determines that the vehicle is running in said motor-drive mode, to place said variable-cylinder engine in a partial-cylinder operating state in which selected ones of said plurality of cylinders are operated.

19. (New) A control apparatus according to claim 18, wherein the vehicle includes a continuously variable transmission through which a drive force of said variable-cylinder engine is transmitted to drive wheel of the vehicle.

20. (New) A control apparatus according to claim 18, further comprising a power-transmission restricting device operable to restrict transmission of a drive force between said variable-cylinder engine and a drive shaft disposed downstream of said variable-cylinder engine, during operation of said variable-cylinder engine in said partial-cylinder by said partial-cylinder operation commanding device.

21. (New) A control apparatus for a vehicle to be driven including a variable-cylinder engine and an electric motor as a drive power source, said variable-cylinder engine having a plurality of cylinders, comprising:

a regenerative-braking-control detecting device operable to determine whether the vehicle is running with a regenerative braking operation of said electric motor so as to convert a kinetic energy of the vehicle into an electric energy; and

a partial-cylinder-operation commanding and power-transmission restricting device, operable when said regenerative-braking-control detecting device determines that the vehicle is running with said regenerative braking operation of the electric motor, to place said variable-cylinder engine in a partial-cylinder operating state and at the same time restricting transmission of a drive force between said variable-cylinder engine and a drive shaft disposed downstream of said variable-cylinder engine, selected ones of said plurality of cylinders of said variable-cylinder engine being operated in said partial-cylinder operating state.

22. (New) A control apparatus according to claim 21, further comprising a coasting-run detecting device operable to determine whether the vehicle is in a decelerating state, and wherein said partial-cylinder-operation commanding and power-transmission restricting device is operated upon determination by said coasting-run detecting device that the vehicle is in a decelerating state, for placing said variable-cylinder engine in the partial-cylinder operating state and at the same time restricting transmission of the drive force between said variable-cylinder engine and said drive shaft.

23. (New) A control apparatus according to claim 22, wherein said partial-cylinder-operation commanding and power-transmission restricting device is operated when said regenerative-braking-control detecting device does not determine that the vehicle is running with said regenerative braking operation of said electric generator or when said coasting-run detecting device does not determine that the vehicle is in said coasting run, said drive-power-source switching device being operable to determine the number of the operating cylinders of said variable-cylinder engine on the basis of an actual running speed of the vehicle and a required output torque of said drive power source, and according to a stored predetermined relationship between said number and said actual running speed and required

output torque, and operate said variable-cylinder engine with the determined number of the cylinders placed in the operating state.

24. (New) A control apparatus according to claim 21, wherein said partial-cylinder-operation commanding and power-transmission restricting device is operable to determine a desired amount of slipping of an input clutch disposed between said variable-cylinder engine and said drive shaft, on the basis of an amount of oscillation of an output torque of said variable-cylinder engine, and according to a stored predetermined relationship between said desired amount of slipping and the amount of oscillation of said output torque, and operable to control said input clutch such that an actual amount of slipping of said input clutch is equal to the determined desired amount of slipping.